Name: Date:

Polynomial Factoring solution (version 633)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 10x + 43 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-10) \pm \sqrt{(-10)^2 - 4(1)(43)}}{2(1)}$$

$$x = \frac{-(-10) \pm \sqrt{100 - 172}}{2(1)}$$

$$x = \frac{10 \pm \sqrt{-72}}{2}$$

$$x = \frac{10 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{10 \pm 6\sqrt{2}\, i}{2}$$

$$x = 5 \pm 3\sqrt{2}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $7 + 3i$ and $-5 + 6i$ in standard form $(a + bi)$.**

Solution

$$(7 + 3i) \cdot (-5 + 6i)$$

$$-35 + 42i - 15i + 18i^2$$

$$-35 + 42i - 15i - 18$$

$$-35 - 18 + 42i - 15i$$

$$-53 + 27i$$

Polynomial Factoring solution (version 633)

3. **Write function $f(x) = x^3 + 15x^2 + 74x + 120$ in factored form. I'll give you a hint: one factor is $(x + 4)$.**

Solution

	1	15	74	120
-4		-4	-44	-120
	1	11	30	0

$$f(x) = (x + 4)(x^2 + 11x + 30)$$

$$f(x) = (x + 4)(x + 5)(x + 6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x + 4) \cdot (x + 1)^2 \cdot (x - 4)^2$$

Sketch a graph of polynomial $y = p(x)$.